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SN 10/668,736

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	COLLINS et al.	Examiner:	M. Marcheschi
Serial No.:	10/668,736	Group Art Unit:	1755
Filed:	September 23, 2003	Docket No.:	58725US002
		Confirmation No.:	1779
Title:	STRUCTURED ABRASIVE WITH PARABOLIC SIDES		

CERTIFICATE UNDER 37 CFR 1.6(d): The undersigned hereby certifies that this correspondence is being transmitted via facsimile to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 20, 2005.

By: Rebecca Ralls
Name: Rebecca Ralls

DECLARATION OF JOHN D. HAAS

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

1. My name is John D. Haas, a named inventor on this patent application.
2. I am currently employed by 3M Company as a Product Development Specialist in the Abrasive Systems Division of 3M. I have been at 3M, in the Abrasive Systems Division, since 1991. I have been working in the area of structured abrasive articles since 1992.
3. Structured abrasive articles have a plurality of composites or protrusions, which comprise abrasive particles and binder, and optional ingredients such as grinding aids, bonded to a backing. The grinding performance of a structure abrasive article is affected by the shape and size of the composite.
4. As a Product Development Specialist of structured abrasive articles, I develop new constructions of structured abrasive articles and modify existing products. I evaluate and

experiment with different composite topographies, including developing new shapes and sizes. I develop and help others develop new tooling for making abrasive articles with composites having the desired performance.

5. As stated above, I am a named inventor on this application. Together with my co-inventors, I developed abrasive composites or protrusions shaped so that the cross-sectional area of the body of the composite varies linearly with the height of the body from the base. Together with my co-inventors, I developed abrasive features or composites having a body including a vertex, wherein the body is defined by four distinct sidewalls each which is defined by a parabolic section.

6. 3M produces a family of structured abrasive articles that have these varying shapes and sizes. These products include those available under the trade designations 217EA, 237AA, 253FA, 305EA, and 307EA.

7. I am familiar with U.S. Patent No. 6,076,248 to Hoopman and Sewall. Although the claims of this patent are directed to a method of making a master for making a production tool that is then used to make structured abrasives, the '248 patent discloses structured abrasive articles where composites can have varying shapes and/or dimensions within the same abrasive article. Various shapes of composites are disclosed, such as cubic, prismatic (e.g., triangular, quadrilateral, hexagonal, etc.), conical, truncated conical, cylindrical, pyramidal, truncated pyramidal and the like. Examples 1 and 1A of the '248 patent have a composite topography of varying pyramids that have a rectangular base having a base width range of 0.016-0.028 inch (406-711 micrometers) with an average base width of 0.023 inch (584 micrometers), pyramid height of 0.014 inch (356 micrometers) and a linear pyramid edge profile. The composites of Example 1 and 1A of the '248 patent are comparable to commercially available product "253FA" from 3M.

8. I am familiar with U.S. Patent No. 5,681,217 to Hoopman and Culler. This patent is directed to structured abrasive articles that are arranged so that an imaginary line drawn in a plane parallel to the base of the composites will intersect at least composite. That is, there is no

line in the abrasive composite array that will not intersect at least one composite. The '217 patent discloses various shapes of composites, such as frusto-conical (truncated cone-flat top), frusto-conical with a rounded, hemispherical or domed outer end, frusto-conical shape terminating at its outer end in a second small conical shape, cubic, prismatic (e.g., triangular, quadrilateral, hexagonal, etc.), conical, cylindrical, pyramidal, truncated pyramidal and the like. The body cross-section can be the shape of a circle, triangle, square, diamond, pentagon, hexagon, oval, octagon and other polygons. Figures 1, 2, 3 and 4 illustrate generally cylindrical, dome-like composites, with concave, convex, and flat tops.

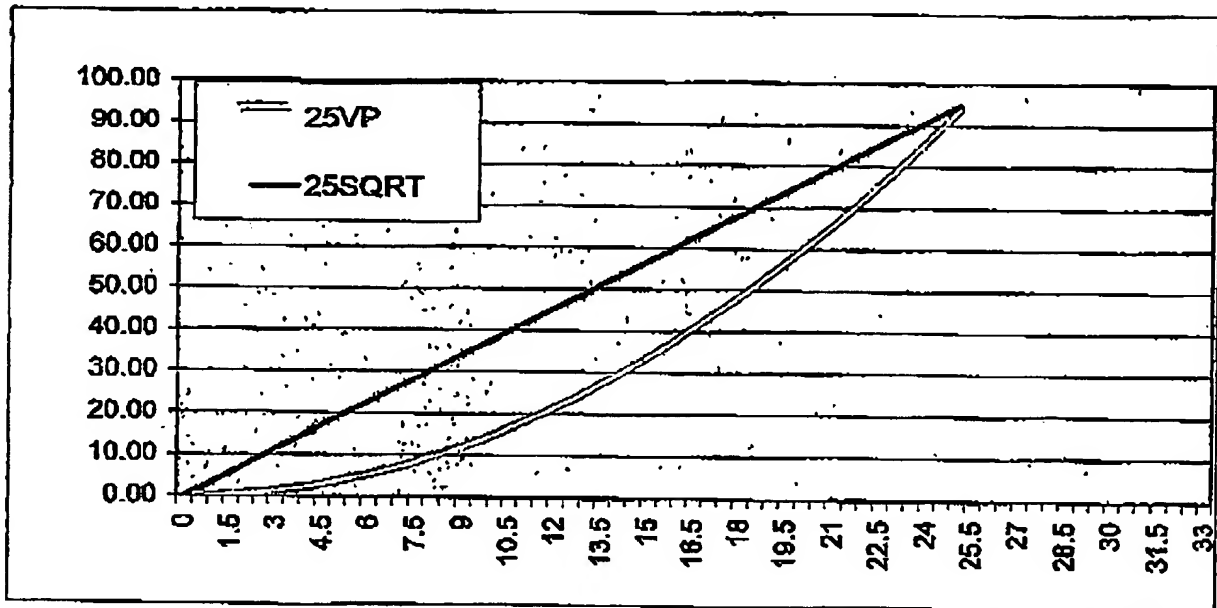
9. I am also familiar with numerous other patents directed to structured abrasives, including U.S. Patent Nos. 5,152,917 (Pieper et al.), 5,549,962 (Holmes et al.), 5,454,844 (Hibberd et al.), 5,672,097 (Hoopman), and 5,489,235 (Gagliardi et al.), all of which are assigned to 3M. I am also familiar with various other patents to structured abrasives, including U.S. Patent No. 5,014,468 (Ravipati et al.).

10. Abrasive composites or protrusions shaped so that the cross-sectional area of the body of the composite varies linearly with the height of the body from the base were not known by myself or my co-inventors prior to this application. None of the above-discussed or listed patents or commercial products disclose composites whose cross-sectional area of the body varies linearly with the height of the body.

11. I evaluated a commercially available product, 237AA from 3M, which is taught by the Hoopman '248 patent, that has pyramidal composites having a rectangular base with a base width range 889-1513 micrometers with an average base width of 1143 micrometers, pyramid height of 635 micrometers, and a linear pyramid edge profile. The cross-sectional area of the composite body, as a function of its height, is shown in the graph below, as the line indicated as "25VP".

12. I also evaluated an abrasive article according to the pending application, specifically, as shown in Figures 2 and 3 of the pending application. The composites had a four-sided rectangular base with a base width of 889-1513 micrometers with an average base width of 1123 micrometers, pyramid height of 635 micrometers, and a parabolic edge profile. That is, each of

the edges was defined by a parabolic section. The cross-sectional area of the composite body, as a function of its height, is shown in the graph below, as the line indicated as "25SQRT".



13. The Hoopman '248 patent does not disclose or suggest a feature or composite having distinct sidewalls that are defined by a parabolic section, or, which have a cross-sectional area that varies linearly with the height of the body from the base. Additionally, no other reference or commercially available product mentioned above discloses or suggests such features.

14. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title XVIII of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated: 4/20/05

John D. Haas